

COMPARATIVE STUDY OF TQM AND SIX SIGMA

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ABSTRACT

In today's worldwide, competitive and constantly changing business sector market commercial enterprises need to look upon global business excellence. As client is prime, it is vital to change of view from being satisfying them to captivate. In most recent two decade numerous quality administration idea, including TQM and six sigma advances. TQM and six sigma serve to enhance primary concern performance. The motivation behind this paper is to show noteworthy contrasts, similarities and strength of TQM and six sigma

KEYWORDS: TQM, Six Sigma, DMAIC

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INTRODUCTION

Deming's 14 principles for in built quality provide foundation for TQM philosophy, while six sigma methodology evolved at Motorola and developed by GE electricals. In the era of globalization, creating better quality according to the universal benchmarks needs multidirectional competitiveness. Commercial enterprises are ceaselessly on the alarm to pick up a competitive edge [1], Yet, the central focus is going astray from general operational incredibleness. Taking care of client requests won't be adequate, prerequisites will be to surpassing them through quality and efficiency change. For that they are utilizing numerous apparatuses and procedures that have long been displayed as an approach to beat the rivalries. For worldwide aggressiveness, commercial enterprises are attempting numerous systems, such as Quality Circles, cost of quality, Total Quality Management (TQM), and ISO Certifications and so forth [2]. Every one of these methods are well equipped for creating the craved results yet the negative side is the issues related with their actualizing obstacles and discriminating achievement variables. While the meanings of TQM, six sigma and incline contrast, the point of the diverse ideas is by all accounts comparable; through enhancements minimizing waste and assets while enhancing consumer loyalty and money related results.[3] Here, near study is completed for TQM and six sigma comparative study.

METHODOLOGY

Six sigma can be viewed as both a business procedure that has the point of lessening production and service costs, and making critical upgrades in consumer loyalty and main concern reserve funds through joining measurable and business process approaches into an incorporated model of procedure, item and service improvements. In six sigma, client center turns into the top need[4]. The focus of six sigma DMAIC methodology is to reduce any variation in accomplishment performance of any critical-to-quality trademark, which is considered a

deformity. This methodology includes,

- **Define:** It defines the problem with specifications, problem statement should be SPECIFIC, MEASURABLE, ACHIEVABLE, REALISTIC, TIME BOUND, since it forming the base for improvement, and also problem statement directly links customer requirements with business excellence.
- **Measure:** During this phase baseline sigma level is calculated and thus the current situation of the process is ascertained a) for discrete data - DPMO is calculated & b) for variable data C_p and C_{pk} index is calculated.
- **Analysis:** course of action is created to close the gap between how things currently work and how they should work to meet improvement goals, Identifies root causes of problem
- **Improve:** Based on analysis, most suitable and economic improvement task is implement.
- **Control:** The basic objectives of this phase are to ensure that our processes stay in control after the improvements has been implemented and to quickly find out of controlling actions and determine the associated root causes so that pre-actions can be taken to control the problem.

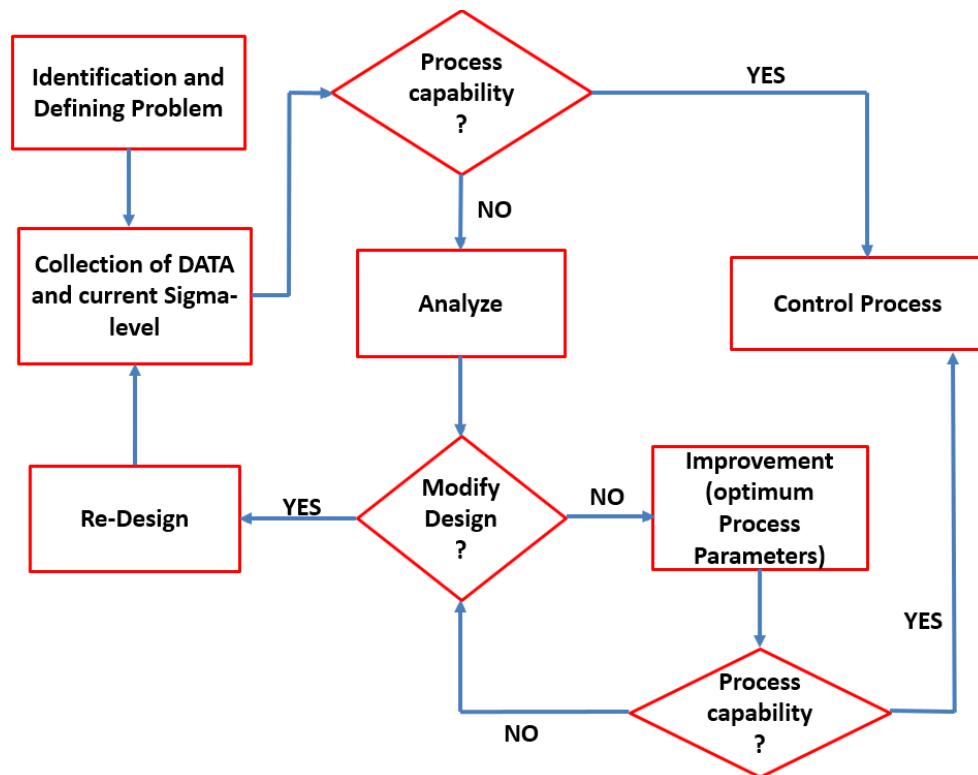


Figure 1: Road-Map for Six-Sigma Methodology[5]

TQM philosophy is management of all organizational process to best satisfy customer (internal and external both) in most economical way. The purpose of TQM is to generate, co-ordinate and sustain quality improvement efforts that focus on customer, continuous improvement and involvement of all. The aim of TQM is do it right at first time and repetition of that every time. However it sees that improvement in quality will lead to improvement in productivity. Deming's 14 principles places foundation for TQM

Total - Made up of whole

Quality - Degree of excellence provided by product or service

Management - Act, art or manner of planning, controlling and directing

SIX SIGMA AND TQM FOCUS AND SCOPE

Six Sigma is a relatively new impression when contrasted with Total Quality Management (TQM). On the other hand, when it was conceptualized, it was not proposed to be a substitution for TQM. Both Six Sigma and TQM have numerous likenesses and can easily accommodate with variety of business situations, including manufacturing and facility sectors. While TQM has helped many organizations in enhancing the superiority of manufactured goods or services rendered, six sigma has the potential of delivering even more keen results.

One contrast between the two frameworks lies in their regions of core interest. While TQM focuses on individual divisions and more particular quantitative objectives, TQM's definitive center is consumer loyalty. The way that takes the business toward that last objective is auxiliary. TQM should be redefined after the pre-set objectives are completed. Six Sigma, be that as it may, goes for constant changes and is self-pushed. Six sigma, when effectively connected, will keep on yielding advantages after the first objectives have been acknowledged as it imparts a culture that eternity plans to enhance execution.

In any case, Six Sigma is solid algorithmic methodology as it gives a roadmap to completing things is an imperative viewpoint isolating Six Sigma from TQM. Another recognizing trademark is the prime capacity of Six Sigma to intelligently incorporated utilization of different tools, systems, techniques that are usually utilized as a part of segregation as it advances through DMAIC or DMADV applications. Furthermore, the calculations are adequately adaptable as to permit even energize for acquiring of valuable techniques from different fields[6].

The fundamental instruments of TQM incorporated the seven quality control tools: control graphs, histograms, check sheets, scramble plots, circumstances and end results outlines, flowcharts, and Pareto diagrams; and the seven quality management tools: interrelationship digraphs, , framework charts, prioritization grids, process decision program chart, tree charts ,activity arrow diagram and affinity chart.[3]

Tools and techniques used with six sigma methodology includes pareto chart, Histogram, Ishikawa fishbone diagram, Flow process chart, SIPOC, CTQs, Process capability, design of Experiment , open and close multivoting, statistical process control charts.

COMPARISON

Six Sigma provides the needed leadership, organizational culture and infrastructure to enable the methods and tools to be successfully deployed across the business. This aspect was totally missing in TQM philosophy[6].

In examination, Six Sigma is more than only a process change program as it depends on ideas that emphasis on ceaseless quality upgrades for restricting so as to accomplish close flawlessness the quantity of conceivable imperfections to under 3.4 deformities for every million[7].It is integral to Statistical Process Control (SPC), which utilizes measurable routines for observing and controlling business forms. Albeit both SPC and TQM assist in with improving quality, they frequently achieve a stage after which no further quality enhancements can be made. Six Sigma, then again, is new

paradigm, distinctive as it spotlights on taking quality change procedures to the upgraded level.

The fundamental contrast between Six Sigma and TQM is the methodology. While TQM sees quality as conformance to inner prerequisites, Six Sigma concentrates on reducing so as to enhance quality the quantity of deformities[8]. The finished result may be the same in both the ideas which is creating better quality items. Six Sigma helps associations in focusing so as to decrease operational expenses on imperfection lessening, reduction in process lead time duration, and expense funds. It is not quite the same as customary expense cutting measures that may lessen worth and quality. It concentrates on distinguishing and provision with expenses that give no valuable quality to clients like expenses acquired because of waste.

TQM concentrates on enhancing singular operations inside random business forms, while Six Sigma system concentrate on enhancing every one of the operations inside of a solitary business process. Six Sigma tasks require the abilities of experts that are confirmed as 'Yellow belts', 'black belts' and 'master black belts'[9], which will work as a team to create a vision and mission of implementation of six sigma in organization from strategic level to operational level and gain continuous improvement, while TQM activities are normally low maintenance movement that can be oversaw by non-dedicated directors and senior managers of organization.

A comparison list of TQM and Six-sigma methodology[10]

Table 1

TQM	Six Sigma
It is vague.	It is specific.
Emphasizes on continuous overall business improvement.	Focus is on quantum break through quality improvement
Works on Group discussion and penal consensus	Works on Data driven methodology
Concentrates on quality idealism.	Concentrates on key objective to reduce variation and its related cost of rejection to enhance key business performance
Lack in specific roadmap, work without knowing full advantages and financial gains	Specific roadmap, works on pre-planned charter activity which outline all information including financial gains.
Works on small-small incremental gains, 10-20%.	Works on quantum gain, 50% gain.
It is Inspired by quality vision.	Driven for well-defined advantages of clients and stakeholders
Measure of progress toward defined objectives is lacking	Measure of progress is highly based on statistical analysis as it is process data driven approach.

Applications Where Six-Sigma is Better

Six Sigma depends on a preplanned venture contract and charter of project that summarizes the size of an undertaking, budgetary targets, foreseen advantages and turning points. In correlation, associations that have executed TQM, work without completely realizing what the monetary profits may be. Six Sigma depends on DMAIC (Define-Measure-Analyze-Improve-Control) that assists in with making exact estimations, recognizing accurate issues, and giving arrangements that can be measured.

Similarities between Six-Sigma and TQM [6]

- It is a client driven methodology.
- It is procedure perspective of work.
- It is a constant improvement outlook.
- Enhancing all perspectives and elements of Enterprise.
- Utilization of statistical tools on wide bases.
- Database choice making.
- Essential top management support to increase moral.
- Aiming for continuous improvement.

Critical Success Factors for Six-Sigma and TQM

If the project selection and goal-setting activity are not done properly, it can lead to failure of the project[11].

The main enabler for Six Sigma and TQM implementation is the top management commitment that can promote an effective company-wide training to allow all employees to involve in the project, training of employees and communication[12].

Many organizations take up several quality initiatives simultaneously and not able to devote their time and resources to successful implementation of any one initiative.

Lack of co-operation, coordination and communication will lead to failure of project[13].

CONCLUSIONS

TQM is only a theory which takes a shot at viable usage of lean tools such as 5s, kaizen, SMED, poka yoke and so on., and henceforth no particular guide is accessible for successfully execution TQM, which prompts disappointment of venture, additionally where in the event of six sigma strategy is lacking in effective implementation in jobbing industry, as it works on principle of reducing variation in product or process. Six sigma is not the same as TQM in that it is actually based and information driven, result situated, giving quantifiable and quantifiable primary concern results, connected to technique and identified with client prerequisites. It is appropriate to all basic business procedures such as Marketing and sales, research and development, administration etc. albeit numerous tools, techniques and procedures utilized as a part of Six Sigma may seem like TQM, they are regularly particular as in Six Sigma, the emphasis is on the vital and precise use of the instruments on focused ventures at appropriate time.

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